

Claims

I claim:

1. A method of adhesive bonding comprising:
 - providing an adherend;
 - providing a substrate;
 - providing a photocurable adhesive;
 - contacting said adherend and said substrate with said photocurable adhesive composition containing an adhesive and an effective amount of microspheres; and
 - photocuring said adhesive composition to form an at least partially cured adhesive composition whereby said adherend and substrate are bonded together.
2. The method of claim 1 wherein said photocuring includes exposing said adhesive composition to an effective dose of ultraviolet radiation for a predetermined time.
3. The method of claim 2 wherein said dose is 40 - 120 J/cm².
4. The method of claim 3 wherein said dose is 90 - 110 J/cm².
5. The method of claim 1 wherein said at least partially cured adhesive composition is at least 90% fully cured.
6. The method of claim 5 wherein said at least partially cured adhesive composition is at least 95% fully cured.
7. The method of claim 1 wherein said microspheres are made of a ceramic material.
8. The method of claim 7 wherein said microspheres are solid substantially throughout their volume.
9. The method of claim 8 wherein the diameters of said microspheres are about 40 microns or less.

1 10. The method of claim 1 wherein said effective amount is about 35 - 75 wt.% of said
2 adhesive composition.

1 11. The method of claim 10 wherein said effective amount is about 60 - 65 wt.% of said
2 adhesive composition.

1 12. The method of claim 1 wherein said microspheres are made from silicate.

1 13. The method of claim 12 wherein said silicate is an alumino-silicate.

1 14. The method of claim 13 wherein said alumino-silicate is an alkali alumino-silicate.

1 15. The method of claim 1 wherein the adhesive composition is a pseudoplastic
2 material.

1 16. The method of claim 1 wherein the thermal coefficient of expansion of the adhesive
2 composition in the photocured state is less than that of said adhesive in the
3 photocured state.